

KIMSOOJA

Mariposa Land Port of Entry

GSA Art In Architecture Program
Final Artwork Concept Proposal

TABLE OF CONTENTS	PAGE
CONCEPT PROPOSAL	3
RENDERINGS	4
EXAMPLES OF VIDEO STILL IMAGES	9
CAD DRAWING SET :	14
A01 SITE PLAN	
A02 PLAN DETAIL	
A03 SECTION	
A04 SOUTH ELEVATION	
A05 MOUNTING DETAILS	
S01 STRUCTURAL - ELEVATION AND DETAILS	
S02 STRUCTURAL - 3D VIEWS	
S03 DAKTRONICS MOUNTING DETAILS FOR LED DISPLAY	
E01 ELECTRICAL - GENERAL PLAN	
E02 ELECTRICAL - GENERAL PLAN	
E02 ELECTRICAL - SINGLE LINE DIAGRAM	
TECHNICAL CONSIDERATIONS	26
APPENDICES	27
APPENDIX A - LED Panel Display - Data Sheet	
APPENDIX B - Preliminary Budget Estimate	
APPENDIX C - Development and Fabrication Schedule	
APPENDIX D - Daktronics Bulletin: Thermal Management	
APPENDIX E - Daktronics Bulletin: Product Reliability Lab	
APPENDIX F - Daktronics LED Panels in Phoenix	
APPENDIX G - Daktronics IMD Workbook	
APPENDIX H - Standard Terms and Conditions of Extended Service - Gold	
APPENDIX I - Standard Terms and Conditions of Extended Service - Platinum Plus	

MARIPOSA LAND PORT OF ENTRY

GSA Art In Architecture Program

Final Artwork Concept Proposal

Artist: KIMSOOJA

Working Title: An Album: Borderlines

Year: 2012 - 2013

Medium: LED video projection in HD format

Duration: Approximately 20 – 30 min. loop with Sound

Edition number: 1 out of 6 + 1AP

CONTRACT NUMBER: 0928001

PROJECT NUMBER: GS-09P-10-KT-0018

KIMSOOJA

Kimsooja gained notoriety in the mid 1990’s following a P.S.1 residency in New York, which paved the way for one of her most famous pieces to date, Bottari Truck, a video that was subsequently shown in numerous exhibitions and biennales. Bottari Truck consisted of a truck loaded with bottari, the Korean word for bundle, and traveled throughout Korea for 11 days. The bundles were actually made of bed covers, an object accompanying the key moments of our existence from birth, marriage, illness, to death. Following the Bottari Truck project, A Needle Woman, a video performance showing the artist from the back standing in the middle of a mainstream avenue in various cities throughout the world, further developed the concept of sewing towards abstraction bringing together people, cultures and civilizations. In a subtle way Kimsooja (b. 1957 in Korea), who works primarily in video, performance, installation, and photography has advanced to a premier artist in her discipline taking up sensitive issues like identity, migration or social cultural issues. Kimsooja has lived in New York since 1999, and her work combines performance, video and installation, addressing issues of the displaced self. Kimsooja brings together a conceptual, logical and structural investigation of performance through immobility that inverts the notion of the artist as the predominant actor. Besides taking us on her journey, Kimsooja’s work is an invitation to question our existence, and the major challenges we are facing in this era.

CONCEPT PROPOSAL

The Mariposa Land Port of Entry is one of the largest and most delicate political checkpoints between the United States and Mexico. For this particular site, I propose a video piece on LED screen to be installed right at the South Gate Entry; this is the first gate that the pedestrian traffic passes through when arriving from Mexico, and the last gate when departing from the United States. I find this site to be one of the most challenging, inspiring, and critical ones for me to work with, as my practice has often dealt with border issues and migrants in the past.

The proposal for the South Gate façade consists of panoramic video portraits of a number of US immigrants from all different continents who have chosen to live in the United States, and second generation immigrants projected from an outdoor LED screen. The screen is positioned in the upper wall structure above of the revolving doors at the south gate. It faces the Mexican side of the border, where pedestrians enter and detainees exit simultaneously. It will serve as a face to those entering the US.

“An Album: Borderlines” attempts to grasp the journey of everyone’s psychological states, from their past, present and future. The piece will be an observation of the reality of people’s presence ‘here and now’, as a group portrait in the current sociopolitical environment, and as a socio-cultural statement about this country as a country of immigrants — their destinies, joys, memories, detachment, and challenges to the society as a witness to the American way of life.

The piece will consist of individuals’ portraits in a vertical frame sitting in three positions; facing the camera, with their back to the camera, and turning their head to look at the camera upon being called by name. Rhythmically appearing and disappearing into the black background screen that is seamlessly divided into multiple vertical sections. The individuals, mostly silent and with their own ways of gaze, looking at their past, present and future. The portraits are at times alone, and at other times presented together with their own portrait or grouped with the others. For example, an individual’s front and back at the same time, or juxtaposed to other individual’s portraits.

In these three distinctive postures I see both a physical and psychological borderline. Turning away from the camera suggests an act of departure or separation, while a frontal image evokes an arrival. The subtle change in each person’s face depicts a psychological journey through his or her own memories of joy, agony, regret, suffering, love, and hope.

This proposal presents an opportunity to bring together different notions of borderline by giving a closer gaze into each person I encounter as an extension of my previous performance video project, A Needle Woman (1999-2001), which I conducted in eight Metropolitans around the world. This project led to A Needle Woman (2005) in Jerusalem, Rio de Janeiro, Havana, Patan, Sana’a, and N’Djamena. These are cities that have significant political, social, religious conflicts, as well as poverty, violence, and postcolonial ramifications. In these performances I stood still, locating my body in the middle of a moving crowd, my body functions as a symbolic axis of time and space within different socio-cultural geographies and at the same time as a borderline between the viewer and the people in the street. I believe the Mariposa Land Port of Entry could serve as an example to bring cultural understanding and positive interaction between the two countries by sharing the emotions, memories, and aspirations we all have in our lives.

RENDERINGS

KIMSOOJA -
MARIPOSA LAND PORT OF ENTRY - PROPOSAL

SOUTH FACING LED DISPLAY
View from Mexican side. Entering the US.



KIMSOOJA -
MARIPOSA LAND PORT OF ENTRY - PROPOSAL

SOUTH FACING LED DISPLAY
View from Mexican side. Entering the US.



KIMSOOJA -
MARIPOSA LAND PORT OF ENTRY - PROPOSAL

SOUTH FACING LED DISPLAY
View from Mexican side towards the US.



KIMSOOJA -
MARIPOSA LAND PORT OF ENTRY - PROPOSAL



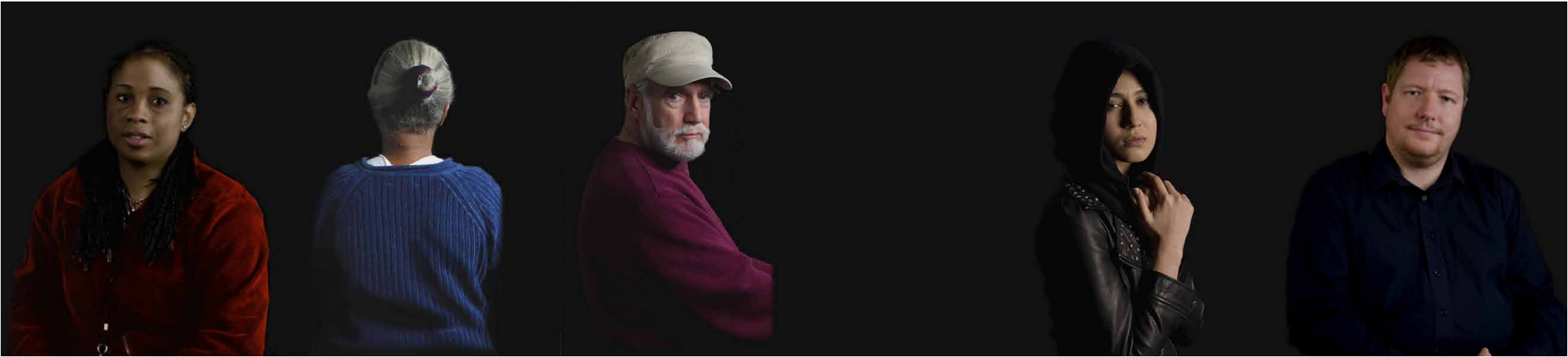
SOUTH FACING LED DISPLAY
View from Mexican side. Entering the US.

VIDEO STILL IMAGE EXAMPLES

Please note: All images provided in this proposal are for the illustration of the final concept but do not constitute actual stills from the content of the final video film strip which will be produced at a future date.









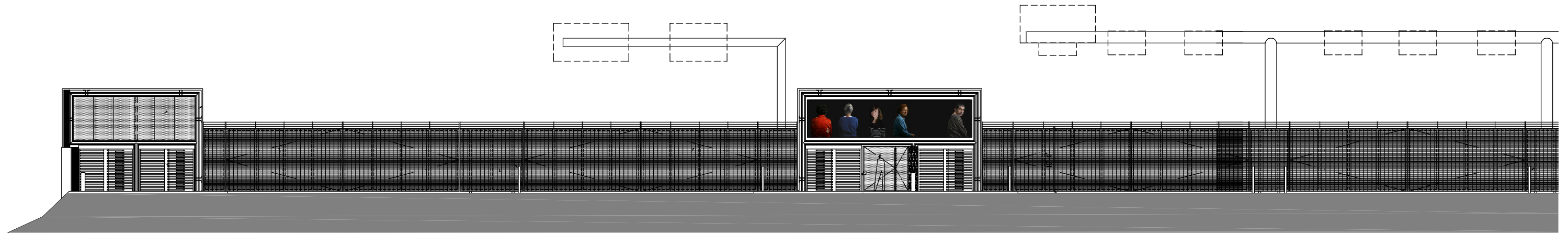
CAD DRAWING SET

PLAN HAS BEEN WITHHELD PER 5 U.S.C. §552(b)(7)(f)

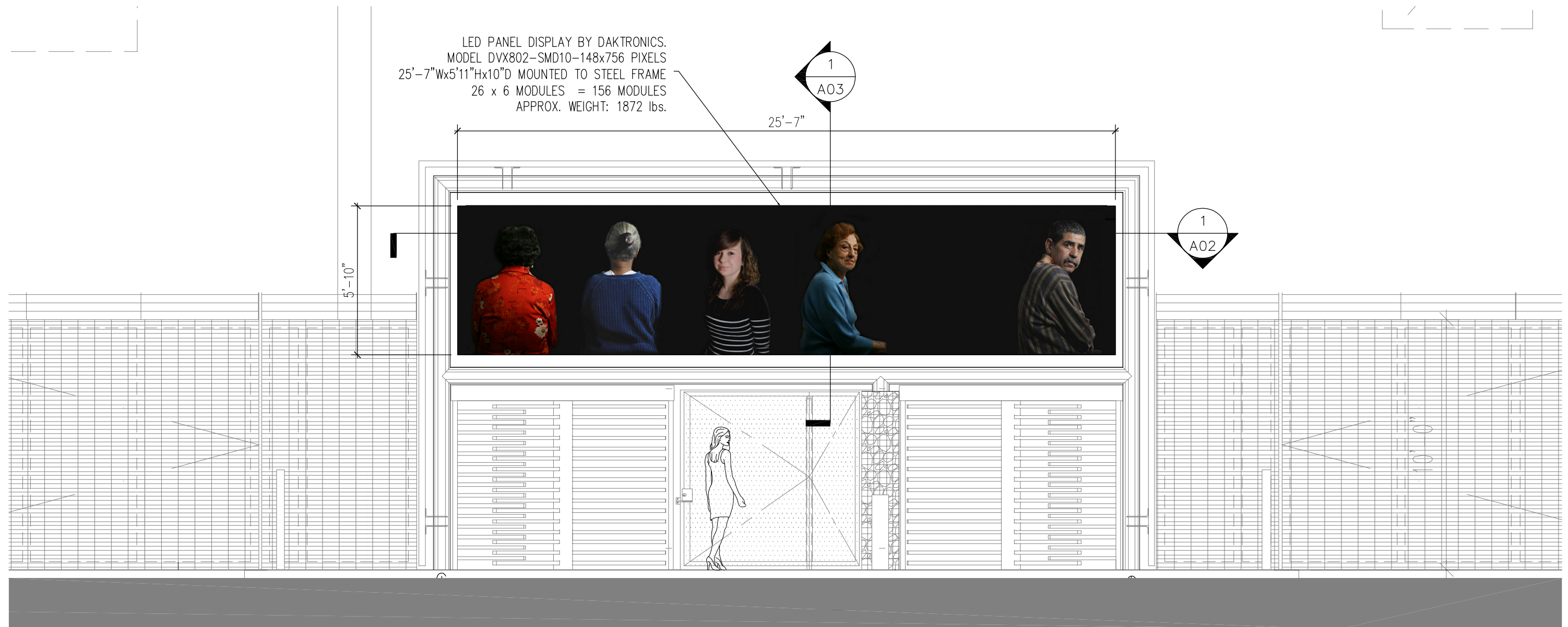
PLAN HAS BEEN WITHHELD PER 5 U.S.C. §552(b)(7)(f)

A02	KIMSOOJA – MARIPOSA INSTALLATION PROPOSAL 2011 . PLAN OF SOUTH GATE WITH LED PANEL DISPLAY	PROGRESS SET	2 JUNE 2011
		FINAL CONCEPT DESIGN SET	12 JULY 2011
1/4"=1'-0"	NOT FOR CONSTRUCTION		

PLAN HAS BEEN WITHHELD PER 5 U.S.C. §552(b)(7)(f)



① SOUTH ELEVATION M BUILDING – WEST END
SCALE: 1/16"=1'-0"



② SOUTH ELEVATION M BUILDING – WEST END
SCALE: 1/4"=1'-0"

DRAWING HAS BEEN WITHHELD PER 5 U.S.C. §552(b)(7)(f)

A05	KIMSOOJA – MARIPOSA INSTALLATION PROPOSAL 2011 . SOUTH GATE – LED PANEL MOUNTING DETAILS	PROGRESS SET	2 JUNE 2011
		FINAL CONCEPT DESIGN SET	12 JULY 2011
SCALE AS NOTED	NOT FOR CONSTRUCTION		

DRAWING HAS BEEN WITHHELD PER 5 U.S.C. §552(b)(7)(f)

S01	KIMSOOJA – MARIPOSA INSTALLATION PROPOSAL 2011 . SOUTH GATE STRUCTURE MODIFICATION – ELEVATION AND DETAILS	PROGRESS SET	2 JUNE 2011
		FINAL CONCEPT DESIGN SET	12 JULY 2011
SCALE AS NOTED	NOT FOR CONSTRUCTION		

DRAWING HAS BEEN WITHHELD PER 5 U.S.C. §552(b)(7)(f)

S02	KIMSOOJA – MARIPOSA INSTALLATION PROPOSAL 2011 . SOUTH GATE STRUCTURE MODIFICATION – 3D VIEWS	PROGRESS SET	2 JUNE 2011
		FINAL CONCEPT DESIGN SET	12 JULY 2011
SCALE AS NOTED	NOT FOR CONSTRUCTION		

DRAWING HAS BEEN WITHHELD PER 5 U.S.C. §552(b)(7)(f)

S03	KIMSOOJA – MARIPOSA INSTALLATION PROPOSAL 2011 . MOUNTING GUIDELINES FOR DAKTRONICS LED DISPLAY	PROGRESS SET	2 JUNE 2011
		FINAL CONCEPT DESIGN SET	12 JULY 2011
SCALE AS NOTED	NOT FOR CONSTRUCTION		

PLAN HAS BEEN WITHHELD PER 5 U.S.C. §552(b)(7)(f)

PLAN HAS BEEN WITHHELD PER 5 U.S.C. §552(b)(7)(f)

DIAGRAM HAS BEEN WITHHELD PER 5 U.S.C. §552(b)(7)(f)

TECHNICAL CONSIDERATIONS

1. DATA FORMAT AND VIDEO QUALITY

Video copy will be delivered both as a very high resolution master copy as well as a formatted video which will play on the LED panel screen. Video format of the master copy will be of the highest resolution possible at the time of production. (eg. Red ‘Epic’ Camera 5K RAW format output to TIF). The high resolution master video will only have content in a central horizontal band having the same 6:26 aspect ratio as the LED display panel. This very high definition master copy will be down-sampled and cropped to produce the formatted playback video which will match the resolution of the LED panel display: 756x148 pixels. In addition to the files specifically formatted for the Daktronics screen the artist will deliver the following items for the collection archive:

- HDCAMSR MASTER TAPE
- Digibeta Standard Definition tape
- Hard drive with HD quick time files
- Blu Ray signed edition copy
- Blu Ray exhibition disc
- Standard def DVD viewing copy

2. PERFORMANCE OF THE LED PANEL IN HARSH CLIMATIC CONDITIONS

Please see:

APPENDIX D - Thermal Management.Tech Note Outdoor SMD
A document from 2009 detailing the thermal management techniques of the panels. Tests up to 110 C (230° F).

APPENDIX E - Daktronics Product Reliability Lab Bulletin. A list of various tests undergone by the LED panels including temperature between -80° C (-112° F) to 170° C (338° F).

APPENDIX F - Daktronics LED panels installed at the Phoenix Convention Center. Map showing the location of four Daktronics LED screens at the Phoenix Convention center, two of which are 10mm pixel pitch. (Daktronics screens have also been installed in Saudi Arabia and Dubai).

3. LONGEVITY OF THE LED PANEL DISPLAY

The standard laboratory tests show a diminished brightness of 50% over the course of 100,000 hours (11 years @ 24 hours per day) with the display outputting 100% white content at full power. This does not correspond to typical usage of the panel. Typical imagery displayed on the panels will be at a fraction of full white (in our case an average 15% over the image field), and playback times will be scheduled to only run during certain periods of the day . Also it must be noted that the screen brightness is more than sufficient for display clarity in typical daytime situations and that any loss of output capability by the LED screen can be complemented by an increase in the output brightness calibration.

All these factors should considerably increase the longevity of the LED display panel.

4. SERVICE AND MAINTENANCE OF THE LED PANEL DISPLAY

The LED panel display is equipped with a fault detection, diagnosis and management system (IDM) which facilitates error management and repair and helps maintain the screen in optimal working condition. The LED panel display is delivered with a 2% spare parts package. The LED panel is modular. It has 156 (26 x 6) modules. In case of failure any module can be repaired and/or replaced. Several types of extended service agreements are available with Daktronics including parts only and parts and labor as well as screen recalibration service.

Please see:

APPENDIX B - Preliminary Budget Estimate

APPENDIX G - Daktronics IDM Workbook which explains the Intelligent Management Device (fault detection, self-diagnostic and management).

APPENDIX H - Standard Terms and Conditions of Extended Service - Gold

APPENDIX I - Standard Terms and Conditions of Extended Service - Platinum Plus

5. POWER CONSUMPTION OF THE LED PANEL

The maximum power consumption of the LED panel display is given as 12320 Watts at maximum output. The average is 3120 Watts. The power requirements are 120/208 Volts 3 Phase, 35 amps per leg.

APPENDIX A - Daktronics LED panel data sheet

5. VANDALISM

Daktronics does not provide any special protection for the LED panel display. Options for repair depend on the severity of the damage. A first step would be to replace the damaged modules with undamaged modules from the spare parts inventory. Then submit the damaged modules to Daktronics for repair and return. Daktronics has been able to clean some modules that have been spray painted depending on the type of spray paint used. Daktronics has also been able to repair light damage to modules that have been struck by a heavy object.

Any additional protection layer would need to be customized and approved by Daktronics.

APPENDICES

APPENDIX A

Specifications for Daktronics DVX802-10SMD

LED panel display

DVX-800-10-SMD



10

10 millimeter
LED VIDEO DISPLAY

The pinnacle of large-scale outdoor video, Daktronics 10 mm LED (light-emitting diode) displays offer a premium, weather-ready video solution with stunning image clarity and a closer-than-ever viewing. A choice solution for flagship sports, advertising, information and entertainment applications requiring ultra-close viewing.

FEATURES

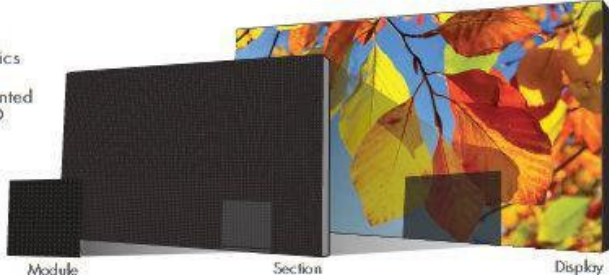
- Produces up to 4.4 trillion colors using state-of-the-art image processing
- Maintains bright, uniform colors using premium 3-in-1 LEDs
- Delivers deeper blacks using contrast-enhancing louvers and module etchings
- Offers an extended display life in any environment using advanced display cooling
- Provides 360° of weather defense with sealed modules
- Eliminates display seams with adaptive cabinet mounting
- Reproduces crisp motion with LED-level (sub-pixel) processing
- Creates countless screen shapes using a flexible cabinet design
- Monitors overall system health with Intelligent Device Management (IDM)



10 millimeter
LED VIDEO DISPLAY

DVX-800-10-SMD

Daktronics LED modules are loaded into Daktronics sections which are then shipped to site and mounted to form a Daktronics LED video display.



TECHNICAL SPECIFICATIONS

Model number	DVX-800-10-SMD
Pixel line-and-column spacing	10 mm (.39")
Pixel configuration	RGB 3-in-1 SMD
Module H x W pixels	30 x 30
Module H x W	300 mm x 300 mm (11.81" x 11.81")
Power/module (1)	20 watts avg (77.40 max)
Weight/module (2)	5.44 kg (12 lbs)
Video processing	19-bit, 100% digital
Color processing	14-bit (4.4 trillion colors)
Dimming capability	5-bit (32 levels)
Color temperature	3,500°-9,000°K (adjustable)
Calibration	Full depth, LED to LED
LED refresh rate	1,000+ Hz
LED lifetime (½ brightness)	100,000 hours
Calibrated intensity (adjustable)	5,000 nits (cd/m²)
Horizontal viewing angle	140° (70° off center)
Vertical viewing angle	75° (+30°/-45° off center)
Contrast ratio (3)	1,000:1
Cabinet depth	257.10 mm (10.12")
Cabinet construction	Aluminum (corrosion resistant)
Data transmission to display	Direct: fiber-optic cable Remote: Internet/network (IP)
Service access	Front or rear
Temperature rating	-35° to 43° C (-31° to 110° F)
Ventilation	Varies by region, DD17125B5
System weatherproofing (front/rear)	IP 65 / IP 55

Note 1: Module weight factors in cabinet. Note 2: Modules feature a proprietary module face mask to diffuse ambient light. Consistent with Daktronics policy of continuing product improvement, specifications shown on this document are subject to change without notice.



201 Daktronics Drive PO Box 5128 Brookings, SD 57006-5128
tel 800-325-8766 605-692-0200 fax 605-697-4700
www.daktronics.com email sales@daktronics.com
Copyright © 2009 Daktronics DD1248164 Rev 09 121609



APPENDIX B - Estimated Budget

Project Budget	\$	550,000.00
General Costs	\$	172,650.00
Kick off Meeting	\$	5,847.14
Studio Coordination	\$	5,000.00
Renderings & Technical Support	\$	10,000.00
Research	\$	1,000.00
Shipping	\$	1,000.00
Final Concept Panel Presentation	\$	2,500.00
Artist's Fee 15% of total commission	\$	82,500.00
Contingency	\$	64,802.86
Filming shoot number 1: (crew of 7 for 5 days)	\$	38,300.00
Filming	\$	3,000.00
Photography	\$	6,500.00
Sound	\$	2,000.00
Travel, hotel and food for artist and crew	\$	17,500.00
Studio Coordination	\$	1,000.00
Camera Rental	\$	3,000.00
Lens Rental	\$	1,000.00
Lighting Rental	\$	1,000.00
Monitor Rental	\$	1,300.00
Scouting Agent	\$	1,000.00
Location Rental	\$	1,000.00
Filming shoot number 2: (crew of 7 for 5 days)	\$	38,300.00
Filming	\$	3,000.00
Photography	\$	6,500.00
Sound	\$	2,000.00
Travel, hotel and food for artist and crew	\$	17,500.00
Studio Coordination	\$	1,000.00
Camera Rental	\$	3,000.00
Lens Rental	\$	1,000.00
Lighting Rental	\$	1,000.00
Monitor Rental	\$	1,300.00
Scouting Agent	\$	1,000.00
Location Rental	\$	1,000.00
Post Production	\$	32,500.00
Video editing and Color correction	\$	15,000.00
Sound editing and Mixing	\$	15,000.00
Creating Computer Files	\$	2,500.00
Equipment	\$	235,500.00
Screen	\$	210,000.00
Video Image Processor	\$	8,500.00
Computer for play back	\$	7,000.00
Speaker Receiver and Amplifier	\$	10,000.00
Installation	\$	32,750.00
Technician Fee for Installation	\$	5,000.00
On-site operator training	\$	9,500.00
Installation Travel	\$	10,500.00
Documentation Filming	\$	1,750.00
Documentation Photography	\$	4,000.00
Opening Travel	\$	2,000.00

Possible costs to be Paid by Construction Dollars		
Structural reinforcements made to the entry gate to support the screen weight.		
Running 1,000 ft of 1" aluminum conduit underground from the station to the gate.		
Possible transformer upgrade from the existing 75 kg volt amps to 85 or 90.		
*Kimsooja is working with Heery to provide a more detailed estimate. Heery will provide the estimate to the Team by the end of the week, Friday, July 15th.		
Possible Future Costs for GSA		
Gold Service Plan - "parts-only" Reference SL-05659 attached.		
1 year included with the product purchase each additional year		
2 years of coverage	\$	1,515.00
3 years of coverage	\$	3,030.00
4 years of coverage	\$	4,545.00
5 years of coverage	\$	6,060.00
Platinum Plus Service Plan – “parts and labor” including annual systems check and service access up to 45’ outdoor. Reference SL-04704 attached.		
1 year upgrade	\$	2,230.00
2 years of coverage	\$	5,975.00
3 years of coverage	\$	9,725.00
4 years of coverage	\$	13,470.00
5 years of coverage	\$	17,215.00
Calibration minimum per trip	\$	4,000.00

PLEASE NOTE: Daktronics will contact the Purchaser at least a month prior to expiration of existing agreement to discuss renewal options. They recommend no more than 5 years worth of coverage at the time of purchase. Generally pricing remains the same or has a small increase after year 5. If pricing is requested today for years 6 and beyond there would be a healthy premium attached since they cannot predict what the pricing may be that far out. They would recommend that you are better off reviewing the pricing at the end of a 3-5 year period.

APPENDIX C
Development and Fabrication Schedule

APPENDIX C - Development and Fabrication Schedule

Filming shoot number 1	1 month
Equipment and crew organization	1 week
Casting of participants	1 week
Filming	1 week
Filming shoot number 2	1 month
Equipment and crew organization	1 week
Casting of participants	1 week
Filming	1 week
Post Production	5 months
Video editing and Color correction	3 month
Sound editing and Mixing	1 month
Creating Computer Files for playback	1 month
Screen Production	3 - 4 months
Screen Installation	1 week
Programming Screen and Checking Playback and Image Quality	1 week
Photography and Documentation	1 week

Combating Heat in Outdoor SMD Displays

With more than 40 years of industry experience, Daktronics has mastered the art of combating heat in LED displays. While other companies have shied away from producing outdoor SMD LED products due to the thermal properties of SMD packages, Daktronics product engineers have worked closely with the company’s product reliability staff to engineer and implement a host of technologies specifically designed to solve the various heat management issues surrounding outdoor SMD LED video. Together, these revolutionary technologies have enabled the company to produce an outdoor SMD LED display line that uses several layers of advanced heat defense to create cool, bright, energy-efficient displays that are suitable for a variety of different applications.

HIGHLY EFFICIENT SMD LEDS

The first line of heat defense comes from high-efficiency Nichia SMD LEDs coupled with a high-contrast louver design that lets SMD packages appear brighter while using less power, minimizing the heat produced by the packages themselves.

ADVANCED COOLING

Engineers placed a thermally conductive paste between the circuit card and rear housing to move heat away from internal components (See **Figure 1**). By drawing heat away from the circuit board, towards the cooler housing, engineers reduced the temperature of the module by spreading out its internal heat more evenly. This protective thermal interface layer between the housing and the circuit board maximizes the rear housing’s efficiency by filling in insulative air gaps that could lead to heat concentrations in the module.

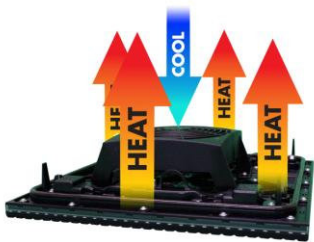


Figure 1: Rear Housing Principle

LOW NOISE MODULE FANS

As a final layer of defense, compact, extremely low noise cooling fans were installed on the back of each display module to circulate cool air across their housing and heat away from the display. The module fans reduced the maximum temperature of each module by an average of 12° Celsius (See **Figure 2**) while also allowing the display’s cabinet fans to run quieter and more efficiently, reducing their perceived noise by 400% from similar models (62 dBA to 43 dBA) and their power usage by 48% (60W to 31W). Combined with the product’s heat conducting housing, the fans provided for a quieter, cooler and more energy-efficient product.

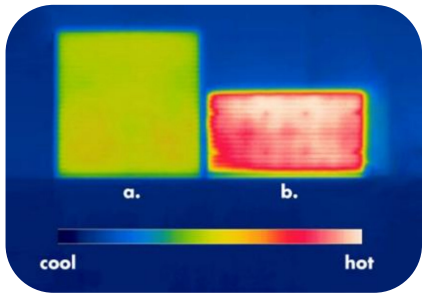


Figure 2: Module Thermograph

- a. Daktronics SMD module with fan
- b. Competitor module

ENVIRONMENTAL TESTING

Upon design completion, the product was put through a series of extensive tests at the Daktronics product reliability lab (See **Figure 3**) where individual modules and entire display fixtures were tested against heat (up to 110° C), cold (down to -60° C) and highly corrosive precipitation (5% salinity fog) for prolonged periods of time.

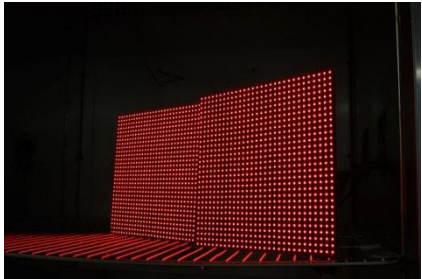


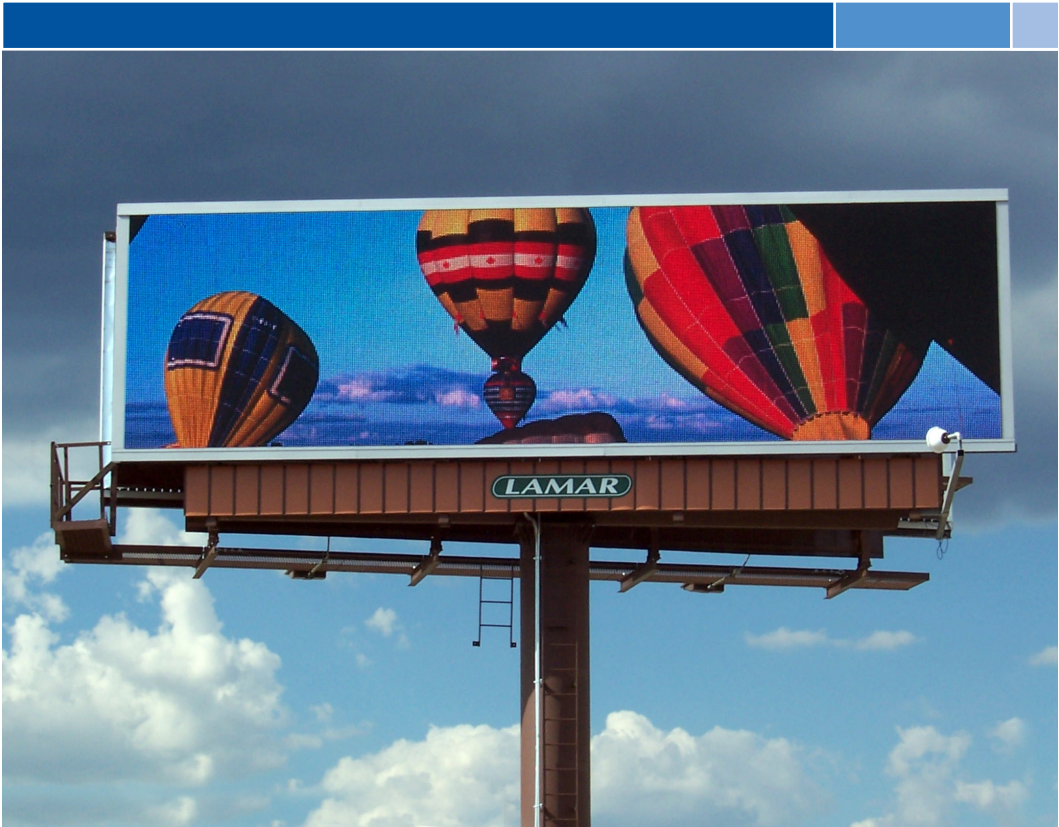
Figure 3: Module Heat Testing

PRODUCT SUCCESS

After passing each environmental test thrown its way, the product was deemed ready for release, and it has already seen several successful installations, ranging from massive video scoreboards (Yankee Stadium, NYC; New Meadowlands, NJ) to outdoor marquee displays (Gillette Stadium, MA; Westfield Group). Its early success has led Daktronics engineers to start developing other outdoor SMD products in different pixel pitches.



	
ENVIRONMENTAL SIMULATOR	CLIMATE CHAMBER
Display-level environmental testing	Testing individual components against cold, heat, and humidity.
<p>While module-level testing provides crucial information on individual component performance, Daktronics understands the big picture of what harsh conditions can do to the entire display. To assure that our displays are as tough as their components, Daktronics technicians use a massive environmental chamber to put entire video boards through a variety of stress tests before product release.</p> <p>With more than 4,550 cubic feet (128.8 cubic meters) of enclosed testing space, the chamber uses powerful heat lamps, massive cooling fans and an adjustable humidity simulator to mimic a variety of different environments, pushing displays to their absolute limits while ultimately assuring a high-performance product engineered to perform in a variety of uninviting conditions.</p>	<p>For component-level environmental testing, Daktronics technicians use a climate chamber to analyze component performance levels under a variety of extreme climatic conditions.</p> <p>From varying temperatures spanning between a frigid -80° C (-112° F) to a blistering 170° C (338° F) to sweltering humidity levels of up to 95 percent RH (relative humidity), the climate chamber puts each new Daktronics product through a series of punishing environmental tests before product release, providing valuable data to help aid continued component improvements.</p>



THE DAKTRONICS PRODUCT RELIABILITY LAB

Taking environmental testing to bold new heights.

Why do industry experts recognize Daktronics as the indisputable leader in display technology? Simple. Daktronics engineers put as much craft and effort into testing their products as they do designing them.

As part of a continuing tradition of excellence in communications technology, Daktronics opened a state-of-the-art product reliability laboratory that uses the latest advancements in environmental technology to test the limits of every Daktronics product, providing valuable feedback during the product development life cycle.

From punishing salt and fog chambers that exaggerate the corrosive effects of coastal precipitation to blistering environmental simulators that mimic extreme climate changes, our dedicated product reliability technicians push each Daktronics product to its absolute performance limits, using their findings to implement continued product improvements and ultimately resulting in superior products that are built to perform for years to come.

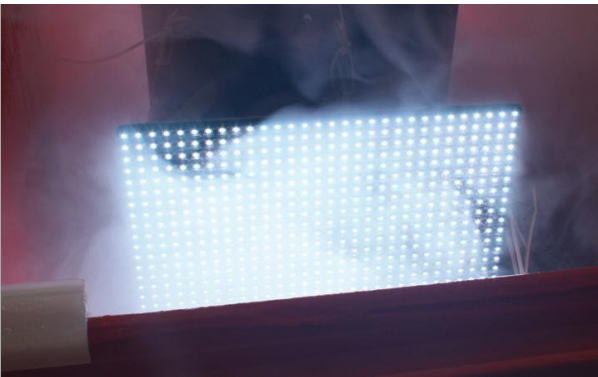


THERMAL SHOCK CHAMBER

Prolonged exposure to extreme temperatures.

While exaggerated climate testing provides valuable data on product performance, Daktronics technicians do not overlook the grueling effects of long-term temperature shock.

Using three isolated chambers (two hot and one cold), the lab's thermal shock chamber alternates product components between extreme heat (200° C, 392° F) and intense cold (-73° C, -99.4° F) for periods of up to a month, providing valuable insight into a component's capacity to handle prolonged temperature extremes.

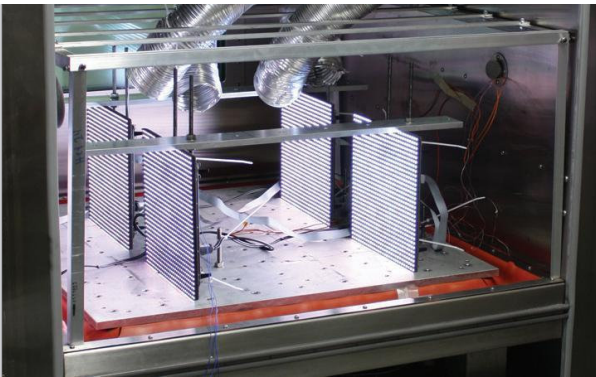


SALT FOG CHAMBER

Measuring the corrosive effects of salty precipitation.

While extreme temperatures shifts and intense humidity can meddle with a product's long-term performance, prolonged exposure to salty coastal air can cause just as much trouble, promoting corrosion within unprotected components.

The Salt Fog Chamber allows lab technicians to punish Daktronics products with a 5 percent salt solution at a sweltering 35° C (95° F) to measure a component's capacity to withstand the corrosive effects of salty coastal air deposited through cooling fans and ventilation devices.



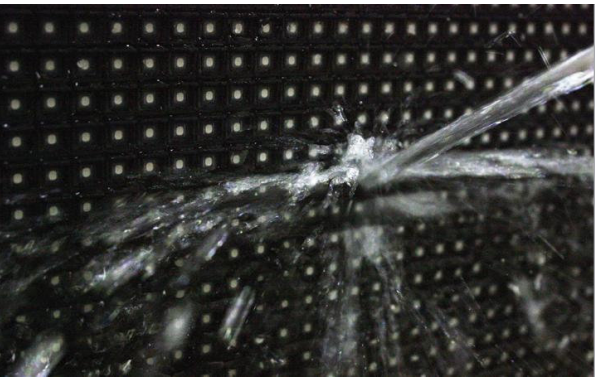
HIGHLY ACCELERATED LIFE TESTING (HALT) CHAMBER

The next generation in environmental testing

The most advanced testing unit of its kind, the lab's HALT Chamber uses a punishing combination of extreme temperature changes and intense mechanical vibrations to stress a product to complete failure, providing valuable insight into a product's estimated lifetime.

Brash temperatures shifts between -110° C (-166° F) and 200° C (392° F) challenge a component's ability to handle harsh climate changes, while menacing mechanical vibrations at rates of up to 5,000 Hz literally push components to their absolute breaking point.

Test results provide our technicians a detailed portrait of a product's vulnerable areas, allowing our engineers to implement continued improvements throughout the product development cycle.



IP VALIDATION (WATER/DUST)

Cabinet Testing For a Weather-Ready Solution

To assure that Daktronics products can hold tough against even the harshest weather, reliability lab technicians perform IP (Ingress Protection) testing to assure proper defense against water and dust intrusion.

Using high-pressure water jets, reliability lab technicians drench entire display enclosures with up to 100 liters (26 gallons) of water per minute from multiple angles to make sure that moisture cannot and will not interfere with critical components.

Supplemental dust testing places products in an airtight enclosure, using a high-power vacuum to help gauge and avert dust penetration. These procedures, combined with the experience gained over thousands of display installations across the world, position Daktronics products among the most reliable and consistent in the industry.

Phoenix Convention Center
Phoenix, Arizona

PS-20 LED video display
96 lines of resolution x
272 columns of resolution
Lines of LEDs on 20 mm (.78") centers
Approx. Dimensions: 6'6" x 18'0"
(1.98 m x 5.49 m)

PS-10 LED video displays (Qty: 2)
330 lines of resolution x
240 columns of resolution
Lines of LEDs on 10 mm (.39") centers
Approx. Dimensions: 11'0" x 8'0"
(3.35 m x 2.44 m)

PS-20 LED video display
16 lines of resolution x
336 columns of resolution
Lines of LEDs on 20 mm (.78") centers
Approx. Dimensions: 1'0" x 22'0"
(.30 m x 6.71 m)

PS-20 LED video display
16 lines of resolution x
176 columns of resolution
Lines of LEDs on 20 mm (.78") centers
Approx. Dimensions: 1'0" x 11'6"
(.30 m x 3.51 m)

Installation Date: Fall 2008





Daktronics Newest LED Display Advancements
January 2010



Table of Contents

DVX Video Displays.....1

- Flexible Caninet Design.....2
- World-Class Uniformity.....3
- DVX In Review.....4

IDM: Intelligent Managment Device.....5

- Why Do I Need IDM?.....6

Visiconn Overview.....7

- Flexible Control.....8
- Content Management.....9

Daktronics ProPixel® Freeform Video10

- Freeform Elements.....11
- Daytime Viewable.....12
- Contrasst Viewability.....13
- Minimum Viewing Distance.....14
- Brightness.....15
- Signal and Electrical Cables....16
- Nighttime Viewable.....17

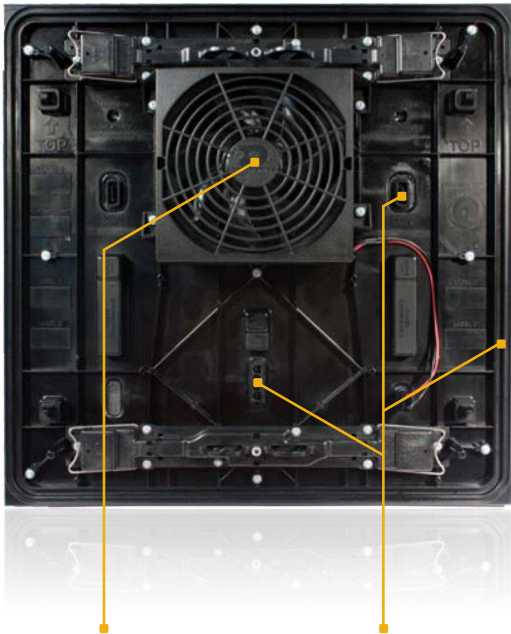
DVX VIDEO DISPLAYS

VISIONARY DESIGN UNPARALLELED VERSATILITY

DVX VIDEO DISPLAYS

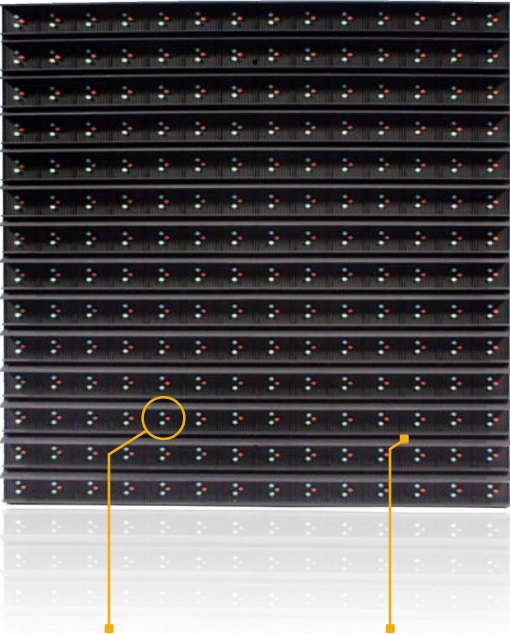
Efficiency, reliability and toughness. These principles drive our technology at Daktronics, and from that tradition comes the DVX collection—a family of displays that offer the same refinement of classic Daktronics video in a smart, adaptable display package.

A host of new technologies, including robust video modules, a flexible cabinet design and advanced weather protection, combine to create an ultra-reliable display that can bring even the wildest creative concepts to life—a valuable addition to the world’s most complete catalog of LED video solutions.



Whisper-Quiet Fans
Feature low-noise, weather sealed components that keep displays running cool and consistent for up to 100,000 hours.

Weather-Sealed LED Modules
Provide 360° of complete weather defense using sealed housing and connection ports.



Next-Generation Nichia® LEDs
Offer wider viewing angles and premium brightness while reducing color shifts across the entire display.

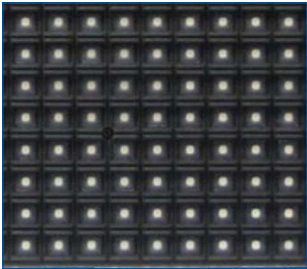
Contrast-Enhancing LED Louvers and Ribs
Produce razor-sharp image contrast and enhanced uniformity while masking module-to-module seams.

ROBUST DISPLAY MODULES

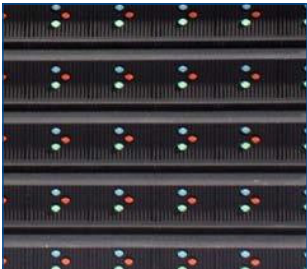
Our most robust module design to date, DVX modules combine complete environmental defense with multiple contrast-enhancing details to create a reliable, weather-ready display with unrivaled uniformity. A flexible variety of pixel configurations makes it easy to design a display to accommodate the unique viewing requirements of any facility.

NOTES

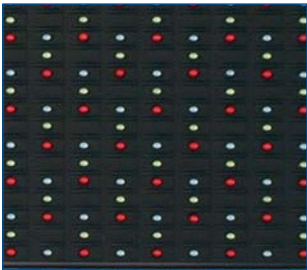
MULTIPLE PIXEL CONFIGURATIONS



SMD
Premium 3-in-1 LED configuration. Ideal for indoor installs requiring ultra-close viewing and broad viewing angles.



Delta
Classic LED configuration. Ideal for outdoor applications requiring longer viewing distances and text-heavy content.



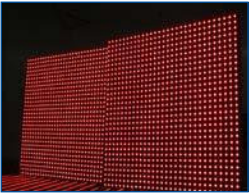
Wide-View
Next-generation LED configuration. Ideal for outdoor installs requiring ultra-wide viewing angles and increased brightness.

UNRIVALED PRODUCT RELIABILITY

World-class displays aren’t born overnight. Displays evolve through persistent engineering and rigorous testing. To take DVX products to the next level, we punished them with extreme heat, enveloped them in a salty, corrosive fog and drenched them with high-pressure water jets. The end result is a world-class display that excels under even the harshest conditions.



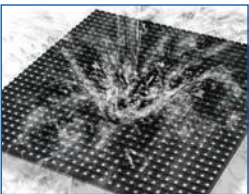
Salt
Corrosion testing against a 5% salt solution ensures complete defense against salty, coastal precipitation.



Heat
Tested against blistering temperature of up to 170° C (360° F), DVX products offer superior performance in even the hottest environments.



Cold
Rigorous stress tests challenge components against ice-cold winds down to -110° C (-166° F) to assure reliable display operation even during frigid winter weather.



Precipitation
Extensive testing against water and dust intrusion ensures the front and rear of each module are protected from rain, snow and dust.

SOLUTIONS

FLEXIBLE CABINET DESIGN

The detail of Daktronics displays does not stop at the module. Our dedicated engineers design each cabinet using precision technology to create a seamless display with unlimited creative flexibility. Lightweight, aluminum framework and a variety of different cabinet sizes allow designers to explore countless shapes and sizes while also ensuring a speedy, efficient installation.

Easy Installation
An adjustable mounting design allows Daktronics cabinets to accommodate nearly any mounting specification, providing for quicker, more cost-effective display installation.



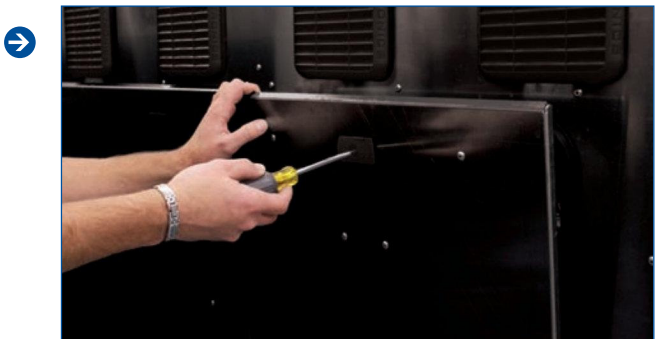
Seamless Display Face
State-of-the-art robotic manufacturing carefully calculates each cut on every cabinet piece to minimize the frequency of display seams while providing for a snug fit between individual modules.



Weather-Tight Ventilation
Moisture-defeating filters seal out dust, precipitation and other debris while keeping critical internal components dry and at an optimal temperature.



Quick Service Access
Convenient rear-access doors allow technicians to reach critical internal components within seconds, making routine display service a breeze.



SOLUTIONS

WORLD-CLASS UNIFORMITY

Why do DVX displays offer the most accurate color in the industry? Our technicians use an approach that takes advantage of LED bin management, factory calibration and field calibration services to produce rich, uniform color for years to come.

LED Bin Management - Our manufacturers sort every LED we purchase into bins according to color variance and intensity to assure striking uniformity before they even reach our facilities.

Factory Calibration - Upon installing the LEDs into modules, we use patented calibration technology to balance the brightness and intensity of each individual LED on the display.

Field Calibration Services - Once we install the display, we offer continued field calibration services to restore a display to its original factory uniformity levels at any point during its lifetime.

Before Calibration ➔
Images can appear grainy and difficult to see.



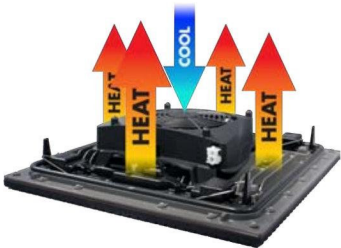
Calibrated ➔
Daktronics patented calibration process provides crisp, intense images for clear visibility.



NOTES

ADVANCED COOLING SYSTEM

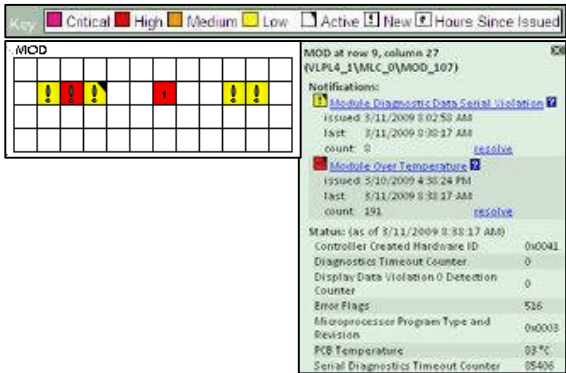
A breakthrough innovation in advanced display cooling, Daktronics outdoor SMD products combine high-efficiency LEDs with thermally efficient housing and a whisper-quiet module fan to draw heat away from the module—eliminating the need for expensive air conditioning while also protecting the uniformity of the display and extending its overall lifetime.



IDM: Intelligent Managment Device

CHANGING HOW CUSTOMERS SERVICE AND MAINTAIN LED DISPLAYS

Inspired by the auto and heavy equipment industries, Daktronics offers diagnostics to customers to check key operating systems—the ones that customers would contact a service provider for technical assistance—within their LED display.



Intelligent Device Management (IDM) proactively detects LED display issues and alerts users instantly. Unlike displays that automatically restart components and “self-heal,” IDM can identify root issues and causes before components need fixes.

ADVANTAGES:

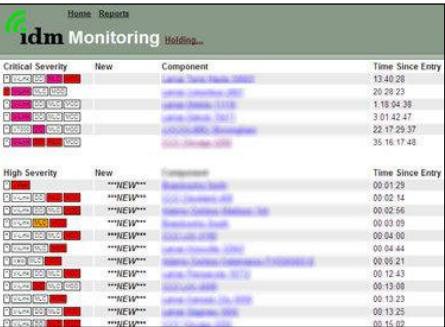
- Allows customers to schedule proactive maintenance rather than accept unplanned outages
- Reduces potential maintenance by allowing pre-failure issues to be proactively fixed ahead of time
- Reduces maintenance costs through remote fixes via the Internet for several issues
- Monitors display health 24/7
- Increases total display uptime
- Alerts Daktronics personnel and customers of operation interruptions via e-mail for rapid responses
- Reduces technicians’ needed troubleshooting time by recording performance history data and providing critical information to help diagnose problems
- Schedules display system updates with the latest software and firmware revisions

NOTES

WHY DO I NEED IDM?

Daktronics developed IDM to alert service personnel in the event of a display component failure. Used for years in Daktronics-manufactured billboards, Daktronics is extending the

IDM offering to other product lines. Prior to this automated notification system, display owners had to rely on visual detection through the use of personnel on site or web cameras. Some companies even went so far as to hire individuals to drive past displays to visually inspect them.



Visual inspection is a haphazard and risky method of ensuring proper display function. It also doesn’t prevent display downtime and the loss of valuable marketing minutes to promote customers’ brands and products.

IDM solves this problem by proactively capturing potential issues ahead of time. IDM communicates with the LED display and instantly notifies personnel of potential issues via email alerts.

As a full-service monitoring system, IDM proactively detects information about all displays in a LED network regardless of the software that is managing the content. This structure allows the maximum flexibility for display owners to choose the solution that best fits their needs.

What systems does IDM check?

- Electrical
- Signal
- Ventilation and cooling
- Control

What specifically does IDM detect?

- Communication failures related to loss of power, signal, or network connectivity
- Corruption of display data
- Thermal gain
- Voltage fluctuations
- Failure of the photocell
- Improper evening brightness
- Incorrect configuration
- Errors in content scheduling or playback with the Visiconn web-based controller

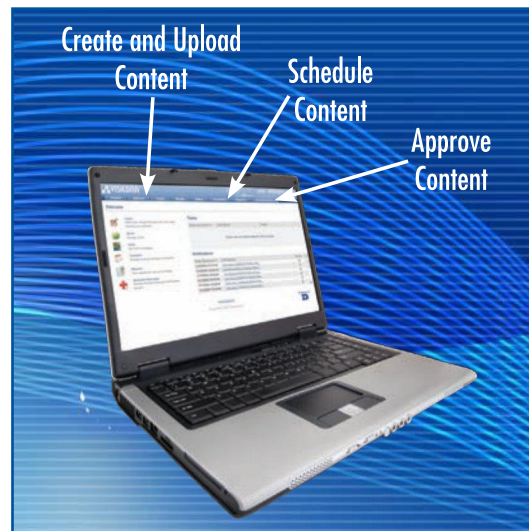
What information does IDM retrieve?

- Configuration settings
- Firmware and software revisions
- Temperatures
- Voltages
- Total error occurrences and types

NOTES

VISICONN OVERVIEW

VISICONN: FAST, SECURE ONLINE DISPLAY CONTROL



The process of creating, deploying, managing and growing a digital display network should be easy. And with Daktronics, it is. We drew upon over 40 years of experience in the digital signage industry and designed a web-based control solution that is simple, easy-to-operate, and accessible wherever you are—as long as you have an Internet connection.

The result? Daktronics Visiconn display management. Visiconn can transform any Internet-ready computer into a secure, global control center for multiple LED billboards, LCD monitors and other displays.

This display management system makes display management of large display

networks quicker, easier, and more convenient than ever before. With the Visiconn solution, users avoid the hassle of installing special software on their computer to control content.

A rights-based control environment allows administrators to grant advertisers access to powerful management tools, while also providing detailed ad tracking and proof-of-play reports.

These features combined with seamless content deployment and the ability to sync with trusted news wires for live, streaming information make the Visiconn display management solution ideal for one-stop, globalized marketing.

SOFTWARE AS A SERVICE

As a Software as a Service, the Visiconn display management solution offers the latest, most up-to-date control software each time you login to the system. This allows you to focus time and assets on building infrastructure instead of your IT staff.



EASY SETUP

Access powerful display management tools from any Internet-ready computer. No software or drivers needed.



INSTANT DEPLOYMENT

Deploy display content anywhere, anytime with secured servers that operate 24/7/365.



REDUCED IT NEEDS

Eliminate the need to dedicate internal IT staff towards software control and control system maintenance.



AUTOMATIC UPDATES

Receive hands-free system upgrades automatically each time newer versions are released.



UPDATE ANYWHERE

"I just got an iPhone about a month ago, and I've used it to upload content to the display."

"It's super user-friendly as far as I'm concerned. I can view the web camera from my iPhone as well, and so I've got access to it all the time."

FLEXIBLE SCHEDULING

"Most of the feedback from the advertisers is absolutely positive. They love the ability to change messages at a moment's notice and communicate with 60,000 people who are going by every day."

Moore said that this level of flexibility saves him time and has made his operations easier.

"My main concern with digital was if I would have time to maintain the art side of it, making changes, and I've found that I do have the time. As soon as I picked up on the software, which was pretty immediate, there's really nothing that I don't feel comfortable doing. It wasn't nearly as time consuming as I'd anticipated it to be."

ROBERT MOORE
RILEY OUTDOOR
OWNER



VISICONN IN ACTION: TULSA EVENTS CENTER—Tulsa, OK

Daktronics Visiconn manages the content on **more than 100 LCD screens** throughout the Tulsa Events Center.

Visiconn content management provides both the Bank of Oklahoma and the events center the flexibility to add and remove content whenever needed, adding independency and security.

The BOK Center's technical staff manages content from the Visiconn system around the clock and enjoys the simplicity of it as it even allows the advertisers to load their own content directly from the web.

The bank, however, uses a third-party manager for content that also takes advantage of the versatility of the Visiconn service.

FLEXIBLE CONTROL

Maintaining corporate control helps you preserve the integrity of your company brand by only allowing administrators the ability to upload and display corporate approved content.

Visiconn provides security to your corporate brand by giving you the option of limiting the content displaying on your network to 100% corporate approved advertising that best suits the location.

ACCESS ANYTIME, ANYWHERE

Because Visiconn is Internet based, you are able to update displays from your place of business, home, or while you're on-the-go. If you've got an Internet connection, you've got access, 24/7.

Visiconn helps you create schedules, organize content, adjust your playlist order, integrate live data, and monitor your entire display network—wherever you may be.



CONTROL MULTIPLE DISPLAYS

Visiconn is the ideal choice for your corporation to control multiple displays and locations from one interface. It's the master control system for all Daktronics manufactured LED video displays, LCD, plasma screens or other displays that accept DVI or VGA signals.



SECURITY AND MONITORING

Visiconn takes advantage of the latest advancements in online security to assure that your display network is secure 24/7/365. All user content is stored and backed up on secure Daktronics servers to ensure complete peace-of-mind. Optional webcam feeds can even show a real-time snapshot of the content being played on any display in your network at any time.



EMERGENCY ALERTS

Not only does the Visiconn display management solution serve your advertisers, it serves your community as well. With fully integrated alert functionality, it can instantly turn any display network into an emergency broadcast system, allowing you to interrupt schedules at any moment to display severe weather information, disaster warnings or AMBER (missing child) alerts.



SET YOUR APPROVAL PROCESS

The Visiconn solution allows you to set up an approval process that harmonizes with how you want to manage your network. Visiconn display administrators have the flexibility to grant other user groups the ability to upload messages to a display network directly, or to require message approval before uploading.

Possible user groups involved in the content process:

- Content providers
- Content schedulers
- Administrators
- Legal
- Merchandising
- Advertising agencies

CONTENT MANAGEMENT

The Visiconn solution offers more than just simple display control. With searchable content libraries, real-time data integration and online content compositing, it can transform any Internet-ready computer into a powerful multimedia hub where you can design, upload and organize a variety of different media clips.



MEDIA LIBRARY

Allow your advertisers to upload, edit and organize their own library of media files. Enable them to quickly locate files with an integrated file search feature.



CONTENT COMPOSITING

Design and layout basic advertisements online with an embedded content compositing application. Save your design work to an integrated media library for quick approval and delivery.



REAL-TIME DATA INTEGRATION

Connect with licensed news, sports and information wires to incorporate live scores, weather reports, travel advisories, stock quotes and breaking news headlines into any graphic layout.



VARIETY OF FILE FORMATS

Enjoy support for a vareity of multimedia formats, including: .jpeg, .gif, .tiff, .bmp, .mov, .avi, .mpeg, and many more.

ADVERTISE TO YOUR TARGET AUDIENCE

The Visiconn solution offers targeted time slots and display locations to best reach the appropriate audience for each message. Customized play lists allow users to enjoy features such as rotating files, scheduling multiple play lists, specifying content order, as well as scheduling by day, time, weekday and more.



STAY UP TO SPEED WITH VISICONN

Administrators and users keep up-to-speed with changes to the Visiconn solution using email notifications.

VISICONN KEEPS YOU INFORMED

Visiconn will also send a notification if a communication issue develops with the displays on the network.

NOTES

SCHEDULING CONTENT

Visiconn packs the industry's most advanced scheduling technology into an intuitive, user-friendly interface that is both easy to learn and easy to execute. Save time by putting similar displays into **groups**. This enables you to send either the same content or schedule to multiple displays at one time.

Playlists

Create custom content playlists that can rotate different ads during different dayparts. Edit, format and choreograph your playlists to accommodate any scheduling needs.

Distribution Charts

Quickly reference the exact time and date of each ad showing with visual playback distribution charts. View increments by minutes, hours, days, weeks or months.

3rd Party Advertising

Generate third-party advertising revenue with multiple tiers of account management. Allow advertising partners to update, edit and manage their own advertising schedules.

Ad Reporting

Produce detailed proof-of-play reports for your displays with built-in ad tracking tools. These reports provide peace of mind and give you proof that your advertisements ran—how long they ran and how much total display time each ad utilized. Use this information to determine how effective your ads are compared to the response you receive from your target audience. Upon retrieval, the reports easily export to a variety of formats. Owners can even allow other users to run their own reports.

ARCHITECTURAL INTEGRATION

With a light-weight design and a thin element profile, ProPixel products are ideal for accenting any structure while advanced color-matching capabilities enable elements to blend in with the background, preserving architectural integrity.



FLEXIBLE & CONCEALED MOUNTING

With options for mounting elements from either the front or rear, Daktronics concealed and secure mounting system ensures a quick, hassle-free installation.



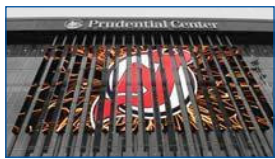
WEATHER RESISTANT

Weather-tight connectors combined with a sealed element housing enables an IP 67 environmental rating for complete protection against dust and moisture penetration.



PIXEL-LEVEL IMAGE MAPPING

Developed specifically for creative displays, Daktronics patented pixel mapping technology easily adjusts video feeds to preserve image integrity and enable displays of any shape or size.



CONTENT-ORIENTED SOLUTION

From simple animations to elaborate video, Daktronics freeform elements provide endless opportunities for promotion, advertisements and entertainment.

DAKTRONICS PROPIXEL® FREEFORM VIDEO ELEMENTS

REVOLUTIONIZING THE LED VIDEO AND LIGHTING INDUSTRY

LED video and lighting are merging, creating a new realm of possibilities never before unleashed. Freeform LED elements are the smallest component that constructs a freeform LED display.

DAKTRONICS PROPIXEL® FREEFORM STICK ELEMENTS (PXS)

Pixels set at specific intervals along the length of a stick

Ideal for:

- Extremely tight radius corners
- Minimum or no display cabinet applications
- Weight restriction specific
- See-through applications
- Long, thin lines of pixels desired

Models:

- HD-16
- 31.25 mm pixel spacing
- 62.5 mm pixel spacing
- 125 mm pixel spacing

Length:

- ½ meter (1.64 ft)

(Available in both horizontal and vertical mounting arrangements.)



DAKTRONICS PROPIXEL® FREEFORM PUCK ELEMENTS (PXC-73)

Single pixel freeform element with a 73 mm diameter

Ideal for:

- Curved shapes in multiple dimensions including spheres
- Variable spacing applications
- No cabinet applications
- Large-scale displays
- Media facades



SOLUTIONS

DAKTRONICS PROPIXEL® FREEFORM ELEMENTS

Show your audience something they’ve never seen before and establish your facility as a landmark. This product can go wherever the architect visualizes an artistic video effect. Integrate ProPixel® elements into media facades, install them over domes or wrap content around structures of any shape or size. Use this product to instill the drama and excitement traditional signage fails to deliver.

An application overview provides an idea of ProPixel freeform elements’ flexibility:

- Channel letters
- Architectural lighting
- Media facades
- Spectacular signage
- Architectural structures
- Video display integration

DESIGNED TO CREATE LANDMARKS

Daktronics’ extensive video experience and years of product research and development helped us to bring this innovative product to the marketplace for architectural applications. Not only can you use this product in beautiful and dramatic ways, its superior design assures:

- The blending of element exteriors into architectural backgrounds through Echo™ environmental integration
- Close adherence to the structure using front and rear mounting options
- Long life, because weather-tight connectors resist corrosive water penetration
- Less power use than neon or tracer lights

SIMPLE & RELIABLE MOUNTING

ProPixel’s concealed fastening methods utilize accessible mounting at both the front or the rear of the element.

Daktronics evaluates each and every customer need to ensure a hassle-free mounting solution for all installations.



SOLUTIONS

DAKTRONICS PROPIXEL® DAYTIME VIEWABLE

Viewers can see freeform elements by day, depending on the product’s manufacturer. Five Factors create daytime element viewing:

• The brightness of the LEDs and pixels:

The brighter the LED or pixel, the more daylight visible it becomes. The more intense a LED or a pixel, the brighter it apperas. LEDs come from manufacturers in different intensities.

In addition, a collective group of LEDs that form a pixel can have different intensities as well. Industry standards dictate that daytime viewable elements should have a brightness rating of 5,000 nits.

• Contrast

A dark background color and strategically placed louvers give an element greater conntrast. A light background color, such as white, will make the LEDs and pixels less viewable, especially when viewed in sunlight.

Louvers added to the element above pixels or individual LEDs help shade the elements from sunlight, reducing the sun’s ability to “wash out” the LEDs brightness. The less contrast, the brighter the LEDs need to be to make the display daytime viewable.

• The spacing of the elements from one another:

Element spacing determines collective intesity. The closer you space elements to one another, the more collective intesity they create to make an image daylight visible. The further you space elements from one another, the less intesnity they create together.

• Display Background

Display background brightness also contributes to contrast. Many times freeform displays are transparent due to empty space affects how well individual elements stand out.

For example, if the background is night sky or black, it increases the contrast between the elements. However, if the background is bright white or open sunlight, the contrast decreases between the elements.

• The angle in which sunlight reaches the display:

Simply put, if sunlight shines directly on a display, viewers will have a harder time seeing the display than when direct sunlight is absent. If the display does not face the sun, viewers can see the display more easily during the daytime.

Keep in mind the spacing between elements, the amount of sunshine streaming through open spaces, and the background contrast behind the display; this affects view ability as well, as noted in the bullet point to the left.

If any factors are ignored, daytime viewing may be affected. Therefore, customers should ask manufacturers questions regarding daytime viewing to gain a thorough understanding of display capabilities.

An easy way to provide daytime visibility is through a product demonstration in the outdoor conditions in which the display will operate.

NOTES

SOLUTIONS

DAKTRONICS PROPIXEL® CONTRAST VIEWABILITY

The greater the contrast, the better the display image’s viewability. Contrast is the brightness ratio of light-to-dark values in an image; this determines display readability. Adjusting the contrast on a video monitor or TV shows the effect.

When contrast increases, colors appear more vibrant and images become easier to see. When contrast reduces, the image appears light and washed out.

This may happen to freeform displays when a dark color background, such as dark wall or the night time sky, is absent between each pixel.

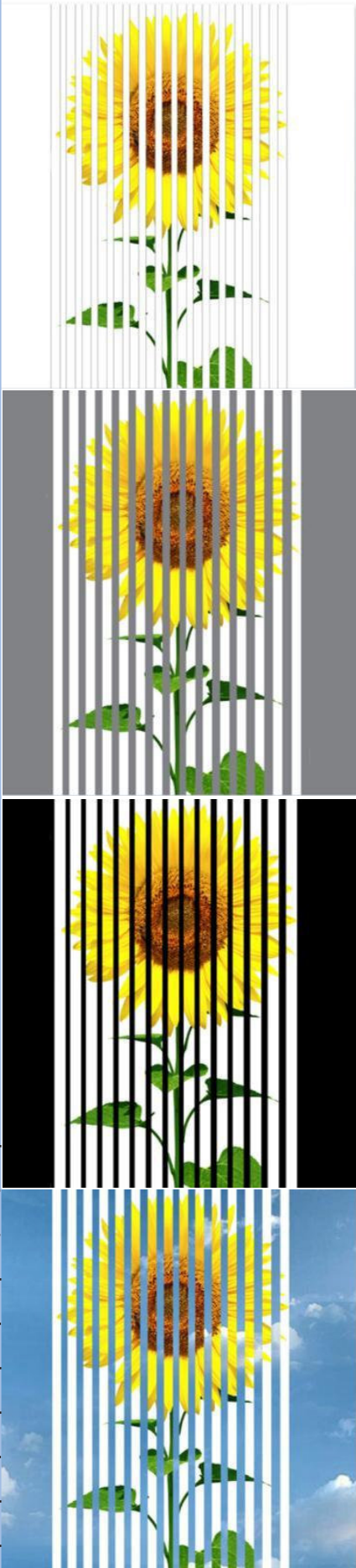
The lighter and brighter the background color, the lower the contrast becomes because the difference between the lit pixel and the background becomes less and less.

A note about contrast: Contrast is critical to an LED display’s viewability. The contrast ratio provided in most manufacturer specifications does not reflect how the actual display will perform in use.

No industry standard for display contrast ratio exists, and each manufacturer determines its own measurement method. Most manufacturers measure contrast under ideal conditions where the difference between the LED’s off state and on state measure at maximum.

In real installation, the display surface will reflect some ambient light, decreasing the contrast ration, and increasing the importance of louvers and element background color.

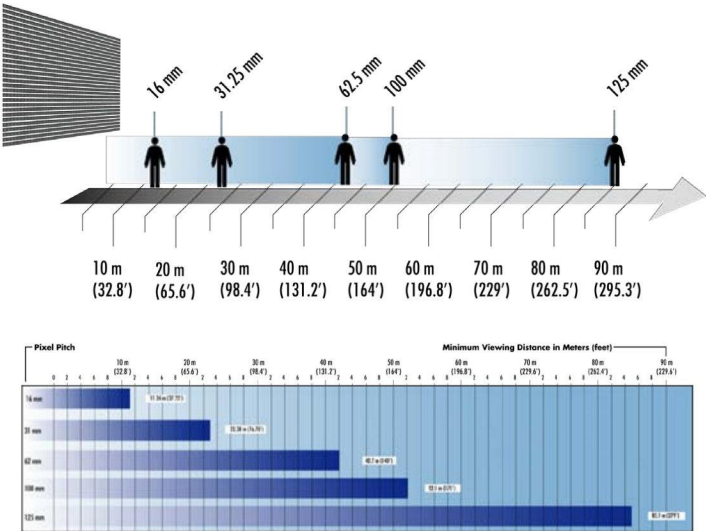
NOTES



SOLUTIONS

PROPIXEL® MINIMUM VIEWING DISTANCE

The minimum viewing distance can be defined as the closest approximate distance at which colors from an individual pixel begin to blend with the surrounding pixels. This example shows pixels spaced at 16, 31.25, 62.5, 73 and 125 respectively. If the spacing changes, the minimum viewing distance will as well.



TRANSPARENCY AND FILL FACTOR

Transparency and fill factor are inversely related: as one increases, the other decreases. Transparency is the percentage of space not occupied by elements, or seen as an equation:

$$\text{Transparency} = \frac{\text{total display area} - \text{elemnt fill area}}{\text{total display area}}$$

OPTIMAL VIEWING DISTANCE OF A FREEFORM LED DISPLAY

Optimal viewing distance is determined by the greater of two measurments: the distance between individual pixels, often referred to as pixel pitch, or the physical center-to-center distance between individual elements.

Optimal viewing distance is the point at which colors from individual pixels begint o blen with teh surround pixels.

Minimum viewing distance is based on the shortest disatance at which an individual perceieves pixels blending together.

Maximum viewing distance is based on teh longest distance at which an individual can still accurately view the image.

SOLUTIONS

MEASURING THE BRIGHTNESS OF A FREEFORM LED DISPLAY

The industry standard measurement for display intensity is nits (cd/m2). To be daylight visible, a display must have at least 5,000 nits.

Since freeform displays may have a varying pixel pitch over the entire display, the correct way to state individual element brightness is candelas per element or candelas per pixel.

If you know the pixel spacing, any manufacturer can determine the display nit rating.

All manufacturers should be able to provide measurement in candelas per element or candelas per pixel.

A candela is a measurement of luminous intensity emitted by a light source in a particular direction. A nit is equivalent to one candela per meter squared (cd/m2).

Other measurements, which typically are used to rate light and lamps, may include a lumen, a measurement of the perceived power of light, and lux, the number of lumens per meter squared (lm/m2).

If a manufacturer gives you these ratings, ask for them in either candelas per element or candelas per pixel.

MOUNTING FREEFORM ELEMENTS TO A STRUCTURE

Freeform element mounting methods and hardware varies depending on teh manufacturer. Elements should be capable of mounting from either the front or the rear and should work with standard mounting hardware. Ask for mounting details from individual manufacturers.

NOTES



SOLUTIONS

SIGNAL AND ELECTRICAL CABLES ON THE FREEFORM ELEMENTS

Some element manufacturers have designed their elements to hide cables, making display installation appear almost cable free. Other manufacturers do not have this capability designed in their product, and their displays may have many cables exposed.

All elements require power and signal sources, and currently this requires cables for transmission between each element.

Additionally, some elements are designed with more than one cable between each element which makes hiding cables more difficult.

Typically when it comes to hiding cables, fewer cables are better. Fewer cables also alleviate confusion during display setup and repair.

WITHSTANDING OUTDOOR CONDITIONS

The electronics of outdoor freeform elements require protection from the environment. Therefore, electronics should have gasketing, coating and other measures to prevent corrosion.

Manufacturers may measure freeform elements’ weather tightness through Ingress Protection (IP) ratings. IP ratings measure an element’s ability to keep out foreign substances, specifically dust and water.

An IP rating consists of two numbers; the first number relates to the intake of solids and the second refers to the intake of liquids.

The higher an IP rating, the better the element repels dust and water. For example, by referring to the chart below, an element rated as IP-67 doesn’t intake dust and can be immersed in one meter of water for 30 minutes and still run.

NOTES

IP Ratings			
First Number		Second Number	
0	No Protection	0	No Protection
1	Protected against large objects up to 50 MM, such as a human hand	1	Protected against vertically dripping water
2	Protected against small objects up to 12.5 MM, such as fingers	2	Protected against dripping water angled up to 15 degrees
3	Protected against objects up to 2.5 MM, such as tools	3	Protected against dripping water angled up to 60 degrees
4	Protected against objects up to 1 MM, such as wires	4	Protected against water splashing from all directions
5	Dust protected - Protected against access of enough dust to interfere with the satisfactory operation of equipment	5	Protected against water jets from all directions
6	Dust tight - Totally protected against the intake of dust	6	Protected against strong water jets from all directions
		7	Protected against immersion (between 15 MM and 1 M in depth)
		8	Protected against submersion

SOLUTIONS

FOR FREEFORM DISPLAYS VIEWED DURING NIGHTTIME ONLY, CAN LED ELEMENT EXTERIORS MATCH BACKGROUNDS TO FORM A STATIC DISPLAY DURING THE DAY?

Yes, but not all manufacturers have this capability. The most advanced manufacturers can customize element exteriors to match Pantone or specific logo colors.

In addition, they can blend exteriors into textures, such as brick and can print complex imagery on element surfaces.

Furthermore, they can offer protection from color fading, helping the element exteriors to maintain their color throughout their lifetime.

How do images on freeform displays maintain integrity and avoid distortion across uneven surfaces?

Pixel mapping maintains image integrity by making images as true-to-life as possible and preventing optical distortion.

Image integrity is important for see-through and sculpture displays that run animations and video content.

Pixel mapping takes an individual pixel from an image and charts it to a specific pixel on a display.

The ratio of pixel mapping can be 1:1, one display pixel for each image pixel, 1:2, one display pixel for every two image pixels, and so forth.

Not all manufacturers offer pixel mapping, and some manufacturer’s pixel mapping is better than others, especially if you chart pixels on an uneven surface.

Superior pixel mapping systems take a standard, rectangular image source and apply it to the display are, accounting for any gaps between pixels and compensating for curved and irregular surfaces.

This allows content to appear custom0tailored to fit the freeform display, giving audiences a top-quality viewing experience



NOTES

Standard Terms and Conditions of Extended Service

1. Scope of Extended Service Agreement. The scope of the Extended Service Agreement may provide for equipment listed on either the face of the document or Attachment A and may include those services as defined on Attachment A (excluding maintenance services which are the responsibility of Purchaser as defined on Attachment A or services which may be purchased for an additional fee). Response Times are defined on Attachment A.

2. Daktronics, Inc. recognizes that Purchaser may, for operating convenience, desire to utilize its own form in acknowledging this order such as issuing a subsequent Purchase Order, or other order confirmation form. Therefore, it is agreed that any Purchase Order or other form subsequently issued shall incorporate the terms and conditions of this Agreement and any provision in the form of acceptance used, which modifies, conflicts with, or contradicts any provision of this Agreement shall be deemed to be waived. This Agreement can only be accepted on the terms set forth hereon.

3. Commencement Date. Unless otherwise agreed to in writing, this Agreement becomes effective upon the date stated as the "Commencement Date" on the cover page of this Agreement.

4. Conditions Precedent. The obligations of Daktronics in this Agreement are subject to the express condition precedent that Purchaser shall perform its obligations under the Agreement, particularly those obligations defined in Attachment A. Daktronics may, at its sole discretion, waive these conditions. The Purchaser's rights and Daktronics obligation under this Agreement shall be suspended until all payments owing to Daktronics are current.

5. Payment Terms. Purchaser agrees to pay Daktronics according to the Payment Schedule as outlined on the face of this document or on Attachment B. In addition, the Purchaser agrees to pay or reimburse Daktronics for any taxes or charges resulting from this Agreement that are levied by a taxing authority, and shall hold harmless and indemnify Daktronics from the claims of any governmental authority asserting that any such Tax is due and payable.

6. Conditions of Coverage. This Agreement provides for the services defined on Attachment A, provided the equipment is installed with the recommended ventilation/air conditioning system for its location. Air conditioning systems must be maintained according to manufacturer's specifications. If equipment contains LEDs, this agreement does not cover LED degradation, which occurs when the LEDs continue to emit light, but at some lesser level of brightness.

Daktronics will repair or replace failed radio components. A radio component has failed when it does not transmit or receive data properly. Local site interference or obstructions may cause intermittent or complete failure of radio performance. This Agreement does not include the provision of replacement communication methods (such as wire, fiber optic cable, conduit, trenching or other solutions) for the purpose of overcoming local site interference.

Certain failures may result in a required total replacement and/or upgrade of any or all of the components in the system. In the event of a failure, the component will be checked thoroughly and if the component can be repaired or replaced, the costs of the repair or the replacement part are included in this Agreement.

If the component cannot be repaired or replaced for whatever reason, and an upgrade is required, then the Purchaser shall be responsible for

the difference in cost between the upgraded component and the cost of the repaired or replaced component to the extent the cost of the upgraded component exceeds the cost of the repaired or replaced component. Further, the Purchaser shall be responsible for any additional upgrades required by the upgraded component in the integrated system.

Daktronics, Inc. will have sole discretion with regard to selecting the parties delivering services under this agreement.

7. Service outside the Scope of Services listed on Attachment A may be provided on a time and material basis according to the then current rates. Subject to the limitations in the Scope of Services, Daktronics will maintain the equipment for normal wear and tear. The equipment may require additional maintenance beyond the Scope of Services attributable to causes other than normal wear and tear. Such causes may include, but are not limited to: inadequate or improper power, improper care or abuse of equipment, unauthorized attempts to repair or modify the equipment, failures caused by environmental conditions beyond Daktronics' control such as corrosives and metallic pollutants, acts of God or nature (including damage done by vermin), terrorism, vandalism, or war.

Service does not include paint or refinishing the equipment or furnishing material for this purpose, electrical work external to the equipment, or service of accessories, alterations, attachments, or other devices not furnished by Daktronics unless otherwise agreed in writing. Batteries and metallic or fiber optic data cable are not covered unless otherwise agreed to in writing.

This Agreement does not cover defects or failure resulting from the use of replacement parts not supplied by Daktronics.

The Purchaser shall provide normal access to the equipment. Normal access is defined as unfettered, solid, safe and unrestricted access to the entire display/equipment, taking into account environmental or site conditions. Unless otherwise specified on Attachment A, the Purchaser shall be required to provide any lifts or access equipment required to access the equipment. Special circumstances will not be covered under this Agreement, including, without limitation, the presence of any additional equipment and/or personnel to ensure safety of service personnel.

In no event shall Daktronics be obliged to perform Services under this Agreement during the existence of Adverse Conditions. "Adverse Conditions" include, among others, without limitation, the following: severe inclement weather, hazardous site conditions including infestations of animals or dangerous insects, saturated ground conditions, or residence or occupation by unauthorized personnel. The determination of a site condition as an Adverse Condition shall be at the sole discretion of Daktronics.

Inaccessibility due to Adverse Conditions will exempt a location from coverage under this Agreement until such time as the equipment becomes accessible once again.

8. Service Request. Purchaser shall fully cooperate with Daktronics in connection with the service of the Equipment. The Purchaser shall immediately notify Daktronics in writing of equipment failure and allow Daktronics full and free access to the



equipment. Waiver of liability or other restrictions shall not be imposed as a requirement prior to accessing the site. Also, the Purchaser will allow Daktronics to use necessary machines, communication facilities, and other equipment at no charge.

9. Return Items. All items returned to Daktronics must have a Return Material Authorization (RMA) number. For exchange items, the number is included with the shipment of the exchange unit. For repair items, an RMA number can be obtained by phone (800-325-8766), (International +1-605-697-4000), fax (605-697-4444) or e-mail (helpdesk@daktronics.com) unless otherwise directed by Daktronics.

10. Shipping. When returning Equipment to Daktronics for repair or replacement, Purchaser assumes all risk of loss or damage, and agrees to use any shipping containers, which might be provided by Daktronics, and to ship the Equipment in the manner prescribed by Daktronics.

11. Limitation of Warranty. Daktronics shall be under no obligation to furnish continued service under this Agreement if the equipment is moved from its location of initial installation or reinstalled without the prior written approval of Daktronics, unless the equipment was designed by Daktronics to be mobile.

12. Confidentiality. Purchaser shall consider all information, including the terms and conditions of this Agreement, furnished by Daktronics to be confidential and shall not disclose any such information to any other person, or use such information itself for any purpose other than fulfillment of this Agreement unless Purchaser obtains written permission from Daktronics to do so. Purchaser shall provide confidential information only to those of its agents, servants and employees who have been informed of the requirements of this paragraph and have agreed to be bound by them. The provisions of this paragraph shall survive termination of the Agreement.

13. Default. Daktronics reserves the right to terminate this contract and accelerate all amounts due and payable if Purchaser fails to make payment to Daktronics within ten days of the agreed payment dates or otherwise fails to comply with this Agreement, or any proceeding is filed by or against Purchaser in bankruptcy. Daktronics reserves all its rights (both legal and equitable) under the contract, applicable statutes, or the common law. Selection of a remedy by Daktronics shall in no way be construed as a waiver of other remedies available to Daktronics. If Purchaser fails to perform any covenant or obligation under this Agreement or any other agreement that Purchaser has with Daktronics, including without limitation the failure to pay when due any amounts owed to Daktronics under this Agreement or any other agreement between the parties, Daktronics shall be excused from the performance of any of its obligations under this Agreement and any other Agreement it has with the Purchaser until such time as said default is cured, if ever.

14. Indemnity. Daktronics shall indemnify, defend and hold harmless the Purchaser and their respective subsidiaries, officers, directors, shareholders, partners, employees, agents, insurers, successors and assigns from any and all liability, losses, damages, costs or expenses (collectively, "Losses") arising out of or in any way related to: (i) any material breach of this Agreement by Daktronics; (ii) any negligent act or omission by Daktronics or its personnel, agents, subcontractors, or others engaged by Daktronics or under Daktronics' control related to the execution of this Agreement; (iii) any claim against any indemnified party by reason of or alleging any unauthorized or infringing use by an indemnified party of any patent, process, trade secret, copyright,

trademark, or other intellectual property right regarding the equipment or the Software and its components; or, (iv) any fine or assessment with respect to any violation or alleged violation of any Applicable Laws regarding safety or health.

The Purchaser shall indemnify, defend and hold harmless Daktronics and its subsidiaries, officers, directors, shareholders, partners, representatives, employees, agents, insurers, successors and assigns of each of the foregoing from any and all Losses arising out of or in any way related to: (i) any material breach of this Agreement by the Purchaser; or (ii) any negligent act or omission by the Purchaser or its personnel, agents, subcontractors, or others engaged by the Purchaser or under their control (other than Daktronics or its personnel, agents, subcontractors, or others engaged by Daktronics or under Daktronics' control).

15. Limitation of Liability. The parties agree that in no event whatsoever shall the liability of either party exceed the amount of the purchase price. It is agreed that in no event shall either party be liable for special, incidental, consequential or indirect damages, regardless of cause. Purchaser understands and agrees that the prices granted herein would be higher in the absence of this limitation of liability. No action against Daktronics shall be commenced more than one year after the accrual of the cause of action. Daktronics shall have no liability with respect to claims relating to or arising from use of third-party products and services.

16. Force Majeure. Daktronics shall be excused from any liability under this Agreement for any delay in performance or failure to perform which delay or failure to perform is caused by circumstances which are beyond the reasonable control of Daktronics, including without limitation acts of God, natural disaster, labor or material shortages, war, earthquakes, acts of terrorism, etc.

17. Assignment. Unless otherwise stated, this Agreement may not be assigned by either party without the written consent of the other party.

18. Termination. If either party neglects or fails to perform any of its obligations under this Agreement, and such failure continues for a period of thirty (30) days after written notice thereof, the other party shall have the right to terminate this Agreement.

19. Miscellaneous. This Agreement shall be governed by the laws of the state of South Dakota without regard to its conflict of law principles. The parties consent to the jurisdiction and venue of the courts of South Dakota for any action, suit or proceeding. This Agreement represents the entire agreement of the parties and supersedes any previous understanding or agreement. This Agreement may not be amended or altered in any manner except in a writing signed by both parties. This Agreement may be executed in counterparts. Each party hereto shall pay its own expenses, including without limitation accounting and attorneys' fees, in connection with this Agreement. The Purchaser and Daktronics are not partners or joint venturers. If any part of this Agreement is in any manner held to be invalid, illegal, void, or to be in conflict with any law, then the validity of the remaining portions or provisions of this Agreement shall not be affected, and such part, term, paragraph or provision shall be construed and enforced in a manner designed to effectuate the intent expressed in this Agreement to the maximum extent permitted by law.

Attachment A

GOLD® Services Scope of Services

Services Included

1. Daktronics parts coverage which includes:
 - 1.1. Daktronics Rapid Parts™ Exchange Program for available parts only.
 - 1.2. Repair or replacement of failed electronic parts or assemblies.
 - 1.3. Shipping of repaired or replaced failed electronic components from Daktronics.
2. Technical support via telephone during business hours as defined below.
3. Access to the Service Coordination Center.

Gold shall not include nor be construed to include any service or support that is not expressly stated above in the definition of the Gold service. Examples of services that are not within the scope of Gold service include, but are not limited to, the following:

1. On-site labor to diagnose and/or replace failed electronic components.
2. Remote monitoring services.
3. After hours telephone support.

Above listed exclusions are available as billable services. Quotes may be provided upon request.

Business Hours:

Monday through Friday, 8 am to 5 pm CST (excludes Daktronics observed holidays).

Purchaser Responsibilities

The items listed below are the responsibility of the Purchaser.

1. Purchaser is responsible for routine operator functions such as content creation or management.
2. Purchaser is responsible for management of customer-owned spare parts inventory.
3. Purchaser is responsible for costs of any on-site labor to diagnose and/or replace failed electronic components.
4. Purchaser is responsible for providing lift access to the display.
5. Purchaser is responsible for the maintenance items listed below; failure to properly maintain equipment may, at Daktronics' sole discretion, relieve Daktronics of its responsibilities under the Standard Terms and Conditions of Extended Service attached hereto.
 - 5.1. Throughout the term of this Agreement, Purchaser shall maintain site conditions within the common environmental range of all system devices as specified by Daktronics.
 - 5.2. Purchaser is responsible for routine maintenance functions.

Standard Terms and Conditions of Extended Service

1. Scope of Extended Service Agreement. The scope of the Extended Service Agreement may provide for equipment listed on either the face of the document or Attachment A and may include those services as defined on Attachment A (excluding maintenance services which are the responsibility of Purchaser as defined on Attachment A or services which may be purchased for an additional fee). Response Times are defined on Attachment A.
2. Daktronics, Inc. recognizes that Purchaser may, for operating convenience, desire to utilize its own form in acknowledging this order such as issuing a subsequent Purchase Order, or other order confirmation form. Therefore, it is agreed that any Purchase Order or other form subsequently issued shall incorporate the terms and conditions of this Agreement and any provision in the form of acceptance used, which modifies, conflicts with, or contradicts any provision of this Agreement shall be deemed to be waived. This Agreement can only be accepted on the terms set forth hereon.
3. Commencement Date. Unless otherwise agreed to in writing, this Agreement becomes effective upon the date stated as the “Commencement Date” on the cover page of this Agreement.
4. Conditions Precedent. The obligations of Daktronics in this Agreement are subject to the express condition precedent that Purchaser shall perform its obligations under the Agreement, particularly those obligations defined in Attachment A. Daktronics may, at its sole discretion, waive these conditions. The Purchaser’s rights and Daktronics obligation under this Agreement shall be suspended until all payments owing to Daktronics are current.
5. Payment Terms. Purchaser agrees to pay Daktronics according to the Payment Schedule as outlined on the face of this document or on Attachment B. In addition, the Purchaser agrees to pay or reimburse Daktronics for any taxes or charges resulting from this Agreement that are levied by a taxing authority, and shall hold harmless and indemnify Daktronics from the claims of any governmental authority asserting that any such Tax is due and payable.
6. Conditions of Coverage. This Agreement provides for the services defined on Attachment A, provided the equipment is installed with the recommended ventilation/air conditioning system for its location. Air conditioning systems must be maintained according to manufacturer’s specifications. If equipment contains LEDs, this agreement does not cover LED degradation, which occurs when the LEDs continue to emit light, but at some lesser level of brightness.
- Daktronics will repair or replace failed radio components. A radio component has failed when it does not transmit or receive data properly. Local site interference or obstructions may cause intermittent or complete failure of radio performance. This Agreement does not include the provision of replacement communication methods (such as wire, fiber optic cable, conduit, trenching or other solutions) for the purpose of overcoming local site interference.
- Certain failures may result in a required total replacement and/or upgrade of any or all of the components in the system. In the event of a failure, the component will be checked thoroughly and if the component can be repaired or replaced, the costs of the repair or the replacement part are included in this Agreement.
- If the component cannot be repaired or replaced for whatever reason, and an upgrade is required, then the Purchaser shall be responsible for

- the difference in cost between the upgraded component and the cost of the repaired or replaced component to the extent the cost of the upgraded component exceeds the cost of the repaired or replaced component. Further, the Purchaser shall be responsible for any additional upgrades required by the upgraded component in the integrated system.
- Daktronics, Inc. will have sole discretion with regard to selecting the parties delivering services under this agreement.
7. Service outside the Scope of Services listed on Attachment A may be provided on a time and material basis according to the then current rates. Subject to the limitations in the Scope of Services, Daktronics will maintain the equipment for normal wear and tear. The equipment may require additional maintenance beyond the Scope of Services attributable to causes other than normal wear and tear. Such causes may include, but are not limited to: inadequate or improper power, improper care or abuse of equipment, unauthorized attempts to repair or modify the equipment, failures caused by environmental conditions beyond Daktronics’ control such as corrosives and metallic pollutants, acts of God or nature (including damage done by vermin), terrorism, vandalism, or war.
- Service does not include paint or refinishing the equipment or furnishing material for this purpose, electrical work external to the equipment, or service of accessories, alterations, attachments, or other devices not furnished by Daktronics unless otherwise agreed in writing. Batteries and metallic or fiber optic data cable are not covered unless otherwise agreed to in writing.
- This Agreement does not cover defects or failure resulting from the use of replacement parts not supplied by Daktronics.
- The Purchaser shall provide normal access to the equipment. Normal access is defined as unfettered, solid, safe and unrestricted access to the entire display/equipment, taking into account environmental or site conditions. Unless otherwise specified on Attachment A, the Purchaser shall be required to provide any lifts or access equipment required to access the equipment. Special circumstances will not be covered under this Agreement, including, without limitation, the presence of any additional equipment and/or personnel to ensure safety of service personnel.
- In no event shall Daktronics be obliged to perform Services under this Agreement during the existence of Adverse Conditions. “Adverse Conditions” include, among others, without limitation, the following: severe inclement weather, hazardous site conditions including infestations of animals or dangerous insects, saturated ground conditions, or residence or occupation by unauthorized personnel. The determination of a site condition as an Adverse Condition shall be at the sole discretion of Daktronics.
- Inaccessibility due to Adverse Conditions will exempt a location from coverage under this Agreement until such time as the equipment becomes accessible once again.
8. Service Request. Purchaser shall fully cooperate with Daktronics in connection with the service of the Equipment. The Purchaser shall immediately notify Daktronics in writing of equipment failure and allow Daktronics full and free access to the



equipment. Waiver of liability or other restrictions shall not be imposed as a requirement prior to accessing the site. Also, the Purchaser will allow Daktronics to use necessary machines, communication facilities, and other equipment at no charge.

9. Return Items. All items returned to Daktronics must have a Return Material Authorization (RMA) number. For exchange items, the number is included with the shipment of the exchange unit. For repair items, an RMA number can be obtained by phone (800-325-8766), (International +1-605-697-4000), fax (605-697-4444) or e-mail (helpdesk@daktronics.com) unless otherwise directed by Daktronics.

10. Shipping. When returning Equipment to Daktronics for repair or replacement, Purchaser assumes all risk of loss or damage, and agrees to use any shipping containers, which might be provided by Daktronics, and to ship the Equipment in the manner prescribed by Daktronics.

11. Limitation of Warranty. Daktronics shall be under no obligation to furnish continued service under this Agreement if the equipment is moved from its location of initial installation or reinstalled without the prior written approval of Daktronics, unless the equipment was designed by Daktronics to be mobile.

12. Confidentiality. Purchaser shall consider all information, including the terms and conditions of this Agreement, furnished by Daktronics to be confidential and shall not disclose any such information to any other person, or use such information itself for any purpose other than fulfillment of this Agreement unless Purchaser obtains written permission from Daktronics to do so. Purchaser shall provide confidential information only to those of its agents, servants and employees who have been informed of the requirements of this paragraph and have agreed to be bound by them. The provisions of this paragraph shall survive termination of the Agreement.

13. Default. Daktronics reserves the right to terminate this contract and accelerate all amounts due and payable if Purchaser fails to make payment to Daktronics within ten days of the agreed payment dates or otherwise fails to comply with this Agreement, or any proceeding is filed by or against Purchaser in bankruptcy. Daktronics reserves all its rights (both legal and equitable) under the contract, applicable statutes, or the common law. Selection of a remedy by Daktronics shall in no way be construed as a waiver of other remedies available to Daktronics. If Purchaser fails to perform any covenant or obligation under this Agreement or any other agreement that Purchaser has with Daktronics, including without limitation the failure to pay when due any amounts owed to Daktronics under this Agreement or any other agreement between the parties, Daktronics shall be excused from the performance of any of its obligations under this Agreement and any other Agreement it has with the Purchaser until such time as said default is cured, if ever.

14. Indemnity. Daktronics shall indemnify, defend and hold harmless the Purchaser and their respective subsidiaries, officers, directors, shareholders, partners, employees, agents, insurers, successors and assigns from any and all liability, losses, damages, costs or expenses (collectively, "Losses") arising out of or in any way related to: (i) any material breach of this Agreement by Daktronics; (ii) any negligent act or omission by Daktronics or its personnel, agents, subcontractors, or others engaged by Daktronics or under Daktronics' control related to the execution of this Agreement; (iii) any claim against any indemnified party by reason of or alleging any unauthorized or infringing use by an indemnified party of any patent, process, trade secret, copyright,

trademark, or other intellectual property right regarding the equipment or the Software and its components; or, (iv) any fine or assessment with respect to any violation or alleged violation of any Applicable Laws regarding safety or health.

The Purchaser shall indemnify, defend and hold harmless Daktronics and its subsidiaries, officers, directors, shareholders, partners, representatives, employees, agents, insurers, successors and assigns of each of the foregoing from any and all Losses arising out of or in any way related to: (i) any material breach of this Agreement by the Purchaser; or (ii) any negligent act or omission by the Purchaser or its personnel, agents, subcontractors, or others engaged by the Purchaser or under their control (other than Daktronics or its personnel, agents, subcontractors, or others engaged by Daktronics or under Daktronics' control).

15. Limitation of Liability. The parties agree that in no event whatsoever shall the liability of either party exceed the amount of the purchase price. It is agreed that in no event shall either party be liable for special, incidental, consequential or indirect damages, regardless of cause. Purchaser understands and agrees that the prices granted herein would be higher in the absence of this limitation of liability. No action against Daktronics shall be commenced more than one year after the accrual of the cause of action. Daktronics shall have no liability with respect to claims relating to or arising from use of third-party products and services.

16. Force Majeure. Daktronics shall be excused from any liability under this Agreement for any delay in performance or failure to perform which delay or failure to perform is caused by circumstances which are beyond the reasonable control of Daktronics, including without limitation acts of God, natural disaster, labor or material shortages, war, earthquakes, acts of terrorism, etc.

17. Assignment. Unless otherwise stated, this Agreement may not be assigned by either party without the written consent of the other party.

18. Termination. If either party neglects or fails to perform any of its obligations under this Agreement, and such failure continues for a period of thirty (30) days after written notice thereof, the other party shall have the right to terminate this Agreement.

19. Miscellaneous. This Agreement shall be governed by the laws of the state of South Dakota without regard to its conflict of law principles. The parties consent to the jurisdiction and venue of the courts of South Dakota for any action, suit or proceeding. This Agreement represents the entire agreement of the parties and supersedes any previous understanding or agreement. This Agreement may not be amended or altered in any manner except in a writing signed by both parties. This Agreement may be executed in counterparts. Each party hereto shall pay its own expenses, including without limitation accounting and attorneys' fees, in connection with this Agreement. The Purchaser and Daktronics are not partners or joint venturers. If any part of this Agreement is in any manner held to be invalid, illegal, void, or to be in conflict with any law, then the validity of the remaining portions or provisions of this Agreement shall not be affected, and such part, term, paragraph or provision shall be construed and enforced in a manner designed to effectuate the intent expressed in this Agreement to the maximum extent permitted by law.

Attachment A

PLATINUM PLUS® Services Scope of Services

Services Included

1. Scheduled on-site labor to diagnose and/or replace failed electronic components.
2. Costs of access to the display/equipment with a 45' aerial lift or bucket truck for outdoor equipment, taking into account environmental or site conditions, or 15' for indoor equipment.
3. Daktronics parts coverage which includes:
 - 3.1. Daktronics Rapid Parts™ Exchange Program for available parts only.
 - 3.2. Repair or replacement of failed electronic parts or assemblies.
 - 3.3. Shipping of repaired or replaced failed electronic components from Daktronics.
4. Technical support via telephone during business hours as defined below.
5. Access to the Service Coordination Center.
6. One Annual Systems Check to include annual filter replacement. Systems check may be provided in conjunction with any service call.

Platinum Plus shall not include nor be construed to include any service or support that is not expressly stated above in the definition of the Platinum Plus service. Examples of services that are not within the scope of Platinum Plus service include, but are not limited to, the following:

1. Display washings.
2. Remote monitoring services.
3. Extended service hours or expedited response times.
4. After hours telephone support.

Above listed exclusions are available as billable services. Quotes may be provided upon request.

BUSINESS HOURS:

Monday through Friday, 8 am to 5 pm CST (excludes Daktronics observed holidays).

INITIATED RESPONSE TIME:

1. Daktronics shall respond to service requests within sixteen (16) business hours.
2. On-site service is to be scheduled during the business hours defined above.

Response is defined as Daktronics must begin to work on a solution to the issue.

Purchaser Responsibilities

The items listed below are the responsibility of the Purchaser.

1. Purchaser is responsible for routine operator functions such as content creation or management.
2. Purchaser is responsible for management of customer-owned spare parts inventory.
3. Purchaser is responsible for lift access charges for equipment which does not meet the criteria stated in Section 2 of the Services Included above.
4. Purchaser is responsible for the maintenance items listed below; failure to properly maintain equipment may, at Daktronics' sole discretion, relieve Daktronics of its responsibilities under the Standard Terms and Conditions of Extended Service attached hereto.
 - 4.1. Throughout the term of this Agreement, Purchaser shall maintain site conditions within the common environmental range of all system devices as specified by Daktronics.
 - 4.2. Purchaser is responsible for routine maintenance functions.